

CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. **(Currently Amended)** A direct-to-digital holography system, comprising:
an illumination lens operable to focus a reference beam;
a beam splitter optically coupled to the illumination lens by the reference beam; and
a reference mirror located at a waist of the reference beam and optically coupled to the illumination lens via the beam splitter ~~oriented relative to the beam splitter and illumination lens~~ such that the reference beam is reflected from the reference mirror to the beam splitter in order to eliminate the need for a reference objective on a reference arm.
2. (Original) The system of Claim 1, wherein the beam splitter comprises a cube beam splitter operable to eliminate first order reflections.
3. (Original) The system of Claim 1, further comprising a quarter-wave plate optically coupled between the beam splitter and the reference mirror.
4. (Original) The system of Claim 1, wherein the reference beam comprises a Gaussian beam.
5. (Original) The system of Claim 1, wherein the reference mirror comprises a flat mirror.
6. (Previously Presented) The system of Claim 1, further comprising the reference mirror operable to maintain optical symmetry of the reference arm and a target arm.

7. (Original) The system of Claim 1, further comprising the reference mirror operable to form a first wavefront substantially similar to a second wavefront formed by the reference objective.

8. (Currently Amended) A method for acquiring a complex image in a direct-to-digital holography system, comprising:

focusing a reference beam with an illumination lens, the reference beam including a waist;

transmitting at least a portion of the reference beam through a beam splitter; and

reflecting the portion of the reference beam from a reference mirror located at the waist of the reference beam and optically coupled to the illumination lens via the beam splitter oriented relative to the beam splitter and illumination lens such that the reference beam is reflected from the reference mirror to the beam splitter, the reference mirror eliminating the need for a reference objective on a reference arm.

9. (Cancelled)

10. (Previously Presented) The method of Claim 8, further comprising forming a combined wavefront at a digital recorder, the wavefront substantially similar to a wavefront produced by the reference objective.

11. (Previously Presented) The method of Claim 8, further comprising the reference mirror operable to maintain optical symmetry of the reference arm and a target arm.

12. (Original) The method of Claim 8, wherein the reference beam comprises a Gaussian beam.

13-32. (Cancelled)

33. (Previously Presented) The method of Claim 8, further comprising the reference mirror operable to form a first wavefront substantially similar to a second wavefront formed by the reference objective.

34. (Previously Presented) The method of Claim 8, wherein the reference mirror comprises a flat mirror.